

CSCE 330 Fall 2024

QUIZ 4

Tuesday 2024-10-08

As you watch the video lecture “Function Level Programming and the FL Language” by Dr. John Backus, available at <https://archive.org/details/JohnBack1987>, answer the following questions:

1. What does it mean for a program to be “referentially transparent?”
Answer: see min 2:25; $P=Q$ iff $F(P) = F(Q)$
2. When writing an FP/FL program, do you work at the object level or at the function level?
Answer: the function level, see min 4.
3. Name three combining forms.
Answer: Composition, construction, condition (min 10:30). Other answers are possible.
4. Write a non-recursive FP/FL function to find the length of a sequence. Write down its application to the sequence $\langle 3, 4, 5 \rangle$.
Answer: (plus) (composed with) (apply-to-all) (constant one), minute 14.
5. Backus argues that, when writing an FP/FL program, you do not need to worry about efficiency, but only about correctness. This is because “mysterious” optimization allows the correctness preserving transformation of inefficient programs into efficient ones. What is “mysterious”?
Answer: Algebraic, min. 20:45.